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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,148	02/27/2004	Choong-Bin Lim	9862-000019/US	4630
30593	7590	09/08/2008		
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 8910 RESTON, VA 20195			EXAMINER SUN, SCOTT C	
			ART UNIT 2182	PAPER NUMBER
			MAIL DATE 09/08/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/787,148

Applicant(s)

LIM ET AL.

Examiner

SCOTT SUN

Art Unit

2182

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9 and 11-18 is/are rejected.
- 7) ☒ Claim(s) 6 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/5/2008 has been entered.

Response to Amendment

2. In response to applicant's amendment filed 8/5/2008, previous grounds of rejection are withdrawn. However, examiner notes that a new prior art has been found which, in combination with prior art of record, provides a new ground of rejection, as attached below.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, 7-9, 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (hereinafter APA) in view of Terry et al

(Pub #2004/0027997, hereinafter Terry) and further in view of Aiken (Pub #2002/0087710, hereinafter Aiken)

5. Regarding claim 1, APA discloses a device (shown in prior art figures 3 and 6) for controlling a first plurality of endpoints (endpoints; figure 3) of a USB device, the device comprising: a plurality of buffers ("ping pong" buffers; figure 3, 6) allocated to the first plurality of endpoints, respectively (background; paragraph 11, 23); and an endpoint buffer controller (MCU 626; figure 6) for managing an exchange of packets between a host and the USB device (paragraphs 23-24).

APA does not disclose explicitly obtaining buffer-utilization information or adaptively adjusting the buffers' capacities. However, Terry discloses obtaining buffer-utilization information (status of the buffer, quality indicator) for each of endpoints (data flows to which buffers are assigned, paragraph 25). Teachings of applicant's admitted prior art and Terry are from the same field of data buffering.

Therefore, it would have been obvious at the time of invention to combine teachings of APA with teachings of Terry by adding the buffer adjustment logic into the buffer system of APA for the benefit of increasing performance of the transmission system (paragraph 15, Terry).

APA and Terry combined does not disclose explicitly adaptively adjusting maximum buffer size allocated to each of the endpoints. However, Aiken discloses adaptively adjusting the respective buffer capacities of the buffers allocated each of the endpoints based upon the buffer utilization information (increasing buffer size of

individual lower interfaces based on need, paragraph 44, further details on reallocating buffer space in following paragraphs).

Therefore, it would have been obvious at the time of invention to combine teachings of APA, Terry and further with teachings of Aiken by using the buffer reallocation scheme in the combined system of APA and Terry for the benefit of fair and efficient usage of buffer space (paragraph 44, Aiken).

6. Regarding claim 2, applicant's admitted prior art and Terry combined disclose claim 1, and applicant's admitted prior art further discloses wherein each for the plurality of buffers has a plurality of units and a maximum size (maximum packet size) of $\text{unit_size} \times Z$, where Z is a positive integer representing the total number of units per buffer, respectively (paragraph 25). Examiner notes that computer memory by definition is organized into a plurality of fixed size units (typically bytes).

7. Regarding claim 3-5, 7, applicant's admitted prior art and Terry combined disclose claim 1, and Terry further discloses counting NAK in a certain time period as a quality indicator to determine quality of channel and corresponding buffer sizes (paragraph 31). Applicant's admitted prior art and Terry does not disclose explicitly the specific hardware, as claimed by applicant, for implementing the method. However, such hardware would have been obvious design choices for a person of ordinary skill in the art in light of the teachings of Terry and applicant's admitted prior art. For example, a timer would be needed to track the time period taught by Terry, a counter would be needed to keep the count of NAK signals taught by Terry.

8. Regarding claim 8, applicant's admitted prior art and Terry combined disclose claim 1 and Terry further discloses wherein the buffers are first-in, first-out (FIFO) buffers (paragraph 12).
9. Regarding claims 9, 12-16, examiner notes that these claims contain limitations that are substantially similar to the above rejected claims, the same grounds of rejection are applied. Note for claim 13 that applicant's admitted prior art disclose using SIE (serial interface engine; figure 2, paragraph 8) as interface to a USB host.
10. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Terry and Aiken, and further in view of Georgiou et al (US Patent #7,003,597).
11. Regarding claim 17, APA, Terry, and Aiken combined disclose substantial portions of the claim (see rejection of claim 1) but do not disclose explicitly adjusting a number of the buffers allocated to each of the endpoints based upon the buffer utilization. However, Georgiou discloses adjusting a number of the buffers allocated based upon the buffer utilization (reallocating the more buffers to compensate for overused buffers) column 3, lines 23-27). Teachings of APA, Terry, Aiken and Georgiou are from the same field of buffer space allocation.

Therefore, it would have been obvious at the time of invention to combine teachings of applicant's admitted prior art with teachings of Terry and further with teachings of Georgiou by using buffer reallocation scheme of Georgiou in the combined

system of Terry and APA for the benefit of decreasing wasted buffer space (column 3, lines 14-16).

12. Regarding claim 18, the limitation is substantially similar to that in claim 1. The same grounds of rejection is applied.

Allowable Subject Matter

13. Claims 6 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. See previous office action dated 9/29/2006 for reasons for allowance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT SUN whose telephone number is (571)272-2675. The examiner can normally be reached on Mon-Thu, 10:00am-8pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

/Tariq Hafiz/
Supervisory Patent Examiner, Art Unit 2182